

Amendments to the Claims:

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

- A 507
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1. (Currently Amended) A method comprising:
compiling statistical models of physical layers of communication system;
creating a priori distributions of cross-talk transfer functions;
storing said statistical models and said a priori distributions in a storage medium; and
using said statistical models and said a priori distributions to diagnose probable causes
of events detected in said communication system.
 2. (New) The method according to claim 1 further comprising using a posteriori statistical
models to update the a priori distribution.
 3. (New) The method according to claim 1 further comprising performing a statistical
parameter estimation.
 4. (New) The method according to claim 1 further comprising performing a hypothesis
test.
 5. (New) A method for diagnosing impairments in a communication system, the method
comprising:
accumulating statistical information about the impairments;
creating a priori statistical models; and
updating the a priori statistical models using a posteriori statistical models of the
impairments.

6. (New) The method according to claim 5, wherein the impairments are external (out of domain) impairments.

A 7. (New) The method according to claim 6, wherein the external impairments are AM interferences.

8. (New) The method according to claim 6, wherein the external impairments are thermal impairments.

9. (New) The method according to claim 6 further comprising detecting a signal to noise ratio change.

10. (New) The method according to claim 6, wherein the communication system is a Digital Subscriber Line (DSL) system.

11. (New) The method according to claim 5, wherein the impairments are internal (in domain) impairments.

12. (New) The method according to claim 11, wherein the communication system is a Digital Subscriber Line (DSL) system.

13. (New) The method according to claim 12 further comprising collecting statistical data about an aggregate signal-to-noise ratio of the communication system.

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14. (New) The method according to claim 13, wherein the statistical data about the aggregate signal-to-noise ratio of the communication system comprises a plurality of distinct probability density functions corresponding to the signal-to-noise ratio of different combinations of the internal impairments and at least on signal line of the DSL system.

15. (New) The method according to claim 12 further comprising collecting statistical information about the aggregate power attenuation values.

16. (New) The method according to claim 5 further comprising performing a statistical parameter estimation.

17. (New) The method according to claim 5 further comprising performing a hypothesis test.

18. (New) The method according to claim 1, wherein the communication system is a Digital Subscriber Line system.

19. (New) A computer readable medium containing executable instructions which, when executed in a processing system, cause said system to perform a method comprising:

compiling statistical models of physical layers of a communication system;

creating at least one a priori distribution;

storing the statistical models and the a priori distribution in a storage medium; and

diagnosing at least one impairment in the communication system using the statistical models and the a priori distribution.

20. (New) A computer readable medium containing executable instructions which, when executed in a processing system, cause said system to perform a method for diagnosing impairments in a communication system, the method comprising:

accumulating statistical information about the impairments;

creating at least one a priori statistical model; and

updating the a priori statistical model using a posteriori statistical model of the impairments.

21. (New) The computer readable medium according to claim 20, wherein the impairments are external (out of domain) impairments.

22. (New) The computer readable medium according to claim 20 further comprising detecting a signal to noise ratio change.

23. (New) The computer readable medium according to claim 20, wherein the impairments are internal (in domain) impairments.

24. (New) The computer readable medium according to claim 23, wherein the communication system is a Digital Subscriber Line (DSL) system.

25. (New) The computer readable medium according to claim 23 further comprising collecting statistical data about an aggregate signal-to-noise ratio of the communication system.

26. (New) The computer readable medium according to claim 25, wherein the statistical data about the aggregate signal-to-noise ratio to the communication system comprises a

plurality of distinct probability density functions corresponding to the signal-to-noise ratio of different combinations of the internal impairments and at least one signal line of the DSL system.

A 27. (New) The computer readable medium according to claim 23 further comprising collecting statistical information about the aggregate power attenuation values.

28. (New) The computer readable medium according to claim 20 further comprising performing a statistical parameter estimation.

29. (New) The computer readable medium according to claim 20 further comprising performing a hypothesis test.

30. (New) An article of manufacture comprising a program storage medium readable by a computer and tangibly embodying at least one program of instructions executable by said computer to perform a method comprising:

- compiling statistical models of physical layers of a communication system;
- creating at least one a priori distribution;
- storing the statistical models and the a priori distribution in a storage medium; and
- diagnosing at least one impairment in the communication system using the statistical models and the a priori distribution.

31. (New) An article of manufacture comprising a program storage medium readable by a computer and tangibly embodying at least one program of instructions executable by said

computer to perform a method for diagnosing impairments in a communication system, the method comprising:

accumulating statistical information about the impairment;

creating at least one a priori statistical model; and

updating the a priori statistical model using a posteriori statistical models of the impairments.

32. (New) The article of manufacture according to claim 31, wherein the impairments are external (out of domain) impairments.

33. (New) The article of manufacture according to claim 31 further comprising detecting a signal to noise ratio change.

34. (New) The article of manufacture according to claim 31, wherein the impairments are internal (in domain) impairments.

35. (New) The article of manufacture according to claim 34, wherein the communication system is a Digital Subscriber Line (DSL) system.

36. (New) The method according to claim 34 further comprising collecting statistical data about an aggregate signal-to-noise ratio of the communication system.

37. (New) The article of manufacture according to claim 36, wherein the statistical data about the aggregate signal-to-noise ratio of the communication system comprises a plurality of

distinct probability density functions corresponding to the signal-to-noise ratio of different combinations of the internal impairments and at least one signal line of the DSL system.

A 38. (New) The article of manufacture according to claim 34 further comprising collecting statistical information about the aggregate power attenuation values.

39. (New) The article of manufacture according to claim 31 further comprising performing a statistical parameter estimation.

40. (New) The article of manufacture according to claim 31 further comprising performing a hypothesis test.